



CASE STUDY: FRP WITH STEEL FITTINGS ACCELERATES INSTALLATION AND REDUCES INSTALLATION COSTS



CHALLENGE

Locals in northeast Oregon described the reduction in groundwater availability as a crisis more than 60 years in the making. More than 200 different crops are grown in the Umatilla Basin, but the development of farmland and cities drove a decline in the aquifers. To secure future population and agricultural growth the Columbia Improvement District used water rights to the Columbia River to add capacity using a new pipeline. The project presented several challenges:

- ▶ Numerous vertical and horizontal curves
- ▶ Installation in winter months
- ▶ Long-term operating costs



SOLUTION

Numerous vertical and horizontal curves

Thompson Pipe Group (TPG) produced 39,000 linear feet of 72- and 75-inch fiberglass reinforced plastic mortar pipe (FRPM) and steel fittings designed for an operating pressure of 180-psi. Engineers designed the pipe to handle a surge from a dead-end condition with a water velocity of 7 feet per second.

During the design process TPG engineers identified a novel solution to navigate the terrain. In most sections a 3-degree gasketed coupling was sufficient to follow the valleys and troughs without fittings. For areas with more challenging terrain, instead of laminate joints or a thrust block, engineers utilized welded steel fittings. TPG developed a specially designed adaptor with very tight tolerance that fit into the FRPM coupling and supplied the steel portion of the project from its SPFA certified manufacturing plant in South Beloit, IL. TPG engineers designed and tested the adaptor in house.

Installation

Installation moved rapidly and was not slowed by snow and cold temperatures. The contractor continually installed more than 1,500 linear feet per day. They used a pipe picker and an excavator bucket to push the pipe joints home. Average installation time for a pipe of this size with all welded joints in these ground conditions would have been approximately 700 linear feet per day.

Bonus: Value Engineering

The original design included 1,000 feet of steel carrier pipe under railroad crossings. After the project was awarded, CID and TPG engineers reviewed the project for cost savings and efficiency. The owner saved money by replacing the majority of steel sections with FRPM.

Long-Term Operating Costs

To reduce shipping costs, TPG nested the FRPM and shipped the 72" inside the 75". This increased pipe diameter leads to less head loss and pumping power. FRPM is corrosion resistant so no cathodic protection or maintenance of a cathodic protection system is required over the life of the project.

